

STATEMENT

*by the Food and Nutrition Board,
National Academy of Sciences-
National Research Council*

Supplementation of Dietary Proteins With Amino Acids

During the past few years the commercial production of a number of amino acids has progressed to the point where the cost is low enough to permit considering them for food fortification. Methionine is being added on an increasing scale to a greater variety of animal feeds. This practice has been shown to improve the feed with a consequent economic gain to the farmer.

Although there are a few reports on the benefits resulting from the supplementation of infant formulas with lysine (1), there is some question about the interpretation of the observation (2). Apart from the preceding consideration, there is a considerable amount of work with animals which indicates that the addition of an amino acid to a poor diet may sometimes aggravate the protein deficiency. These disturbances may result not only in poorer growth but also in the development of abnormalities such as fatty livers (3, 4).

The Food and Nutrition Board of the National Research Council at a recent meeting issued the following statement.

The possibility of correcting a dietary deficiency of an amino acid by supplementation with that acid is an attractive one. There are, however, several guiding principles which should be emphasized at this time.

Attention is called to the Statement of General Policy in Regard to the Addition of Specific Nutrients to Foods, issued by the Food and Nutrition Board in November 1953:

“With carefully defined limitations, the principle of the addition of specific nutrients to certain staple foods is endorsed for the purpose of maintaining good nutrition as well as for correcting deficiencies in the diets of the general population or of significant segments of the population. The requirements for endorsement of the addition of a particular nutrient to a particular food include (a) clear indications

of probable advantage from increased intake of the nutrient, (b) assurance that the food item concerned would be an effective vehicle of distribution for the nutrient to be added, and (c) evidence that such addition would not be prejudicial to the achievement of a diet good in other respects.”

Some 25 amino acids are needed for the formation of the various cellular proteins of the body and for other special metabolic functions. Most of these acids can be synthesized by the body, if dietary protein intake is adequate. There are, however, at least eight which must be supplied daily by the protein in the diet in proportions and amounts to meet the requirements of metabolism. Any dietary protein which is relatively deficient in one or more of these essential amino acids has a reduced nutri-

tive efficiency. Emphasis is placed, therefore, upon the development of an adequate pattern of essential amino acids in the diet as well as upon the maintenance of an adequate protein intake. Although reasonable estimates can be made of the amino acid mixture which appears "ideal," the limits through which the pattern may vary and still be considered adequate are as yet unknown. Similarly, the definition of the amounts of protein of varying amino acid composition which are required for good nutrition under different physiological states requires further study.

There is reason for believing that nutritive requirements in disease may differ considerably from those in health. An amino acid pattern that is optimum for health and normal growth may require modification in pathological states in which the metabolism of one or another amino acid may be adversely affected. The study of amino acid metabolism in disease and the determination of desirable amino acid patterns in pathological states seem to be matters of great importance which may reveal particular needs for supplementation with specific amino acids or for the reduction of the intake of particular amino acids in the diet.

The imbalance of essential amino acids found

in some dietary proteins cannot always be corrected by adding a single amino acid, the imbalance being the result of a deviation in several of the essential amino acids from an "ideal pattern" needed by the body. Multiple supplementation is generally required. This type of supplementation is at present best achieved by mixed diets where one food protein supplements another. The benefits to be derived from amino acid supplementation are uncertain until our knowledge of the consequences of the amino acid imbalance is more complete. The Food and Nutrition Board recognizes the potential value of proper supplementation with amino acids and the desirability of intensive study of this problem.

REFERENCES

- (1) Albanese, A. A., Higgons, R. A., Hyde, G. M., and Orto, L.: Biochemical and nutritional effects of lysine-reinforced diets. *Am. J. Clin. Nutr.* 3: 121-128, March-April 1955.
- (2) Amino acid supplementation of foods for infants and children. *Nutrition Rev.* 14 101-103, April 1956.
- (3) Elvehjem, C. A., and Harper, A. E.: Importance of amino acid balance in nutrition. *J. A. M. A.* 158: 655, June 25, 1955.
- (4) Elvehjem, C. A.: Amino acid balance in nutrition. *J. Am. Dietet. A.* 32: 305-308, April 1956.

Education Projects for Retarded Children

Two cooperative research projects on the education of mentally retarded children were approved by the Office of Education, Department of Health, Education, and Welfare, in April 1957.

One of the projects, to be directed by Dr. Frances Mullen, assistant superintendent of schools of Chicago, will deal with the educational problems of mentally retarded children in special and regular classroom conditions. The Illinois State Department of Public Instruction and the city of Chicago will both participate.

The other project, with California participating, will be concerned with the effects of special training classes for severely retarded children. Dr. Leo Cain, dean of education services of San Francisco State College, will direct the project.

Sixty-six projects have been approved for cooperative educational research since September 1956. Thirty-nine of these concern education of the mentally retarded.